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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,858	05/11/2006	Zachary Buckner	3053.153.US	3331

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UNIVERSITY OF VIRGINIA PATENT FOUNDATION  
250 WEST MAIN STREET, SUITE 300  
CHARLOTTESVILLE, VA 22902

EXAMINER
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TAYLOR, VICTOR J

ART UNIT	PAPER NUMBER
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2863

MAIL DATE	DELIVERY MODE
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05/08/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/578,858	<b>Applicant(s)</b> BUCKNER, ZACHARY	
	<b>Examiner</b> VICTOR J. TAYLOR	<b>Art Unit</b> 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-108 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-108 is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/18/08, 3/24/08</u>  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

1. Claims 1-108 are pending in the instant application. Therefore, claims 1-108 are presented for examination.

### ***Drawings***

2. The drawing was received on 5/11/2006. These drawings are approved.

### ***Information Disclosure Statement***

3. The information disclosure statement (IDS) was submitted on 1/18/2008 and on 3/24/2008. These IDS submissions are in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner is considering the information disclosure statements in this office action.

### ***Specification***

4. The disclosure is objected to because of the following informalities:

I. Objection to dependent claim 31, which has an improper claim dependency.

The dependent claim to the system in claim 31 further limits the third transducer and the fourth transducer of which is not found in claim 4, thereby introducing an antecedent problem for claim 31, wherein claim 41 cites the first, second, third and fourth transducers. It is not clear as the claim dependency for the further limiting for the third and forth transducers. Corrections are required.

***Priority***

5. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) to US 60/523,648 of 11/20/2003 is acknowledged.

***Quayle Action***

6. This application is in condition for allowance except for the following formal matters:

I. Correction to dependent claim 31, to correct the antecedent problem for claim 31 which further limits the third transducer and the fourth transducer of which is not found in claim 4 or the chain of dependent claims.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 25 USPQ 74, 453 O.G. 213, and (Comm'r Pat. 1935). A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this action.

***Prior Art***

7. The prior art made of record and not relied upon is considered pertinent to applicant.

I. Art A of Taniguchi US Patent 4,972,080 A is cited for the signal processing apparatus for pulse encoder with A/D data conversion and clocking using signal processing for pulse encoding using a first and second signal with sine zero degree and cosine 180 degree phase shift signal processes (2) in figure 5 wherein the signal

process and apparti provide for signal processing of pulse encoded signals in line 55-65 of column 1.

II. Art B of Bartelt US Patent 4,728,193 A is cited for the computations for precision interferometer alignment and position detector for determining the relative location of an object wherein a collimated coherent light beam is directed on the composite diffraction grating (12) in figure 1 wherein the positioning of the offset position enables the alignment system in line 38-44 of column 2 using positioning with stepper motors in lines 25-30 of column 6.

***Allowable Subject Matter***

8. Claims 1-108 are allowed.

9. The following is an examiner's statement of reasons for allowance:

I. Regarding claim 1, the primary reason for the allowance of claim 1, a system for detecting movement of a substrate, is the inclusion of the limitations wherein the steps for "a first signal acquisition system means for acquiring a first substantially sinusoidal signal related to the position of the substrate" ...[and] "a second signal acquisition system means for acquiring a second substantially sinusoidal signal related to the position of the substrate that is substantially 90 degrees out of phase with the first substantially sinusoidal signal" ...[and] in the particularly claimed combination with "a signal selection system means" ...[wherein] the steps for "comparing the first substantially sinusoidal signal and the second substantially sinusoidal signal" ...[and] combined with the steps for "selecting the signal with the lesser instantaneous magnitude as the primary signal" ...[and] "selecting the signal with the greater

instantaneous magnitude as the secondary signal"...[and] thereby "producing a reference signal indicating whether the first substantially sinusoidal signal or the second substantially sinusoidal signal was selected as the primary signal"...[and] in combination with the steps for a "phase angle converter for converting the primary signal into a phase zero degree phase angle signal"...[and] "an angular movement detection"...[and] "determining the angular movement over time based on the value of the phase angle signal over time"...[and] thereby "producing a corresponding angular movement signal" is not found in the cited art of record.

It is these limitations as claimed in this combination that is not found or taught or suggested in the prior art of record that makes these claims allowable over the prior art.

Claims 2-54 which are dependent on the allowed independent claim 1 are allowed at least for the reason cited above.

II. Regarding claim 55, the primary reason for the allowance of claim 55, a method for detecting movement of a moving substrate, is the inclusion of the limitations wherein the steps for "acquiring a first substantially sinusoidal signal related to the position of the substrate...[and] acquiring a second substantially sinusoidal signal related to the position of the substrate that is substantially 90 degrees out of phase with the first substantially sinusoidal signal...[and] in combination with the particularly claimed steps for "comparing the first substantially sinusoidal signal and the second substantially sinusoidal signal"...[and] with the steps for "selecting the signal with the lesser instantaneous magnitude as the primary signal"...[and] with the further steps for "selecting the signal with the greater instantaneous magnitude as the secondary

signal"...[and] thereby "producing a reference signal indicating whether the first substantially sinusoidal signal or the second substantially sinusoidal signal was selected as the primary signal"...[and] with the steps for "converting the primary signal into a phase angle signal"...[and] thereby "determining the angular movement over time"...[and] "producing a corresponding angular movement signal" is not found in the cited art of record.

It is these limitations as claimed in this combinations that is not found or taught or suggested in the prior art of record that makes these claims allowable over the prior art.

Claims 56-108 which are dependent on the allowed independent claim 55 are allowed at least for the reason cited above.

The cited Art A of Taniguchi teaches the signal processing apparatus for pulse encoder with A/D data conversion and teaches steps for clocking using signal processing for pulse encoding using a first and second signal with sine zero degree and cosine 180 degree phase shift signal processes(2) in figure 5. And further teaches the signal process and the apparti to provide for the signal processing of pulse encoded signals in line 55-65 of column 1.

The cited Art B of Bartelt teaches the computations for precision interferometer alignment. And he further teaches the position detector for determining the relative location of an object wherein a collimated coherent light beam is directed on the composite diffraction grating (12) in figure 1. He further teaches the object positioning of the offset position enables the alignment system in line 38-44 of column 2 and further teaches using the positioning of stepper motors in lines 25-30 of column 6.

Therefore, the prior art A of Taniguchi and The prior art B of Bartelt in combination or alone does not teach the present limitations of the claimed combination limitation.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

### ***Conclusion***

10. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VICTOR J. TAYLOR whose telephone number is (571)272-2281. The examiner can normally be reached on 8:00 to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571-272-2863. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should



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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free)?

/VJT/  
4/30/2008.

/John E Barlow Jr./  
Supervisory Patent Examiner, Art Unit  
2863